

## ABSTRACT

A coding section 201 of a transmitter receives an input of a transmitting signal and LDPC-codes the received signal, a serial-to-parallel conversion section 102 converts the coded signal from serial to parallel, and outputs  $m$  ( $m \geq 2$ ) intermediate signals, a unitary matrix modulation section 103 modulates the  $m$  intermediate signals to a unitary matrix of  $m$  rows and  $m$  columns where elements excepting diagonal elements are zero, and outputs an obtained matrix, a split section 111 supplies each of the diagonal elements of the matrix to each input channel of an inverse Fourier transform section 112 as an input signal, the inverse Fourier transform section 112 inversely Fourier transforms the input signals supplied to the input 10 channels, and outputs the obtained  $m$  inversely Fourier transformed signals, a parallel-to-serial conversion section 113 converts the  $m$  inversely Fourier transformed signals from parallel to serial, and outputs one transmission signal, a transmitting section 114 transmits the output transmission signal, and any of frequency differences between the channels of the inverse Fourier transform section 112 is a predetermined coherent 15 bandwidth or more.